

CLAIMS

1. High strength hot rolled steel sheet excellent in burring, elongation, and ability of phosphate coating characterized by being a steel composition containing, by
5 mass%, C: 0.02 to 0.08%, Si: 0.50% or less, Mn: 0.50 to 3.50%, P: 0.03% or less, S: 0.01% or less, Al: 0.15 to 2.0%, and the balance of iron and unavoidable impurities, satisfying the following formula, having a microstructure of said steel sheet having a ratio of ferrite of a grain
10 size of 2 μm or more of at least 40%, and having a tensile strength of at least 590 N/mm²:

$$\text{Mn} + 0.5 \times \text{Al} < 4 \quad (1)$$

2. High strength hot rolled steel sheet excellent in burring, elongation, and ability of phosphate coating characterized by having a tensile strength of at least
15 590 N/mm² as set forth in claim 1, further containing, by mass%, one or two or more of Ti: 0.003% to 0.20%, Nb: 0.003% to 0.04%, V: 0.003% to 0.20%, Ca: 0.0005 to 0.01%, Zr: 0.0005 to 0.01%, a REM: 0.0005 to 0.05%, and Mg:
20 0.0005 to 0.01%.

3. High strength hot rolled steel sheet excellent in burring, elongation, and ability of phosphate coating characterized by having a tensile strength of at least
25 590 N/mm² as set forth in claim 1 or 2, characterized by satisfying $0.3 \times \text{Al} + \text{Si} - 2 \times \text{Mn} \geq -4 \dots (2)$ and having a microstructure of a grain size 2 μm or more ferrite and martensite two-phase structure.

4. High strength, hot rolled steel sheet excellent in burring, elongation and ability of phosphate coating
30 characterized by having a tensile strength of at least 590 N/mm² as set forth in claim 1 or 2, characterized by having a microstructure of a grain size 2 μm or more ferrite and bainite two-phase structure.

5. A method of production of high strength hot
35 rolled steel sheet excellent in burring, elongation, and ability of phosphate coating characterized by having a

tensile strength of 590 N/mm² or more characterized by ending hot rolling of a slab comprised of a steel composition as set forth in any one of claims 1 to 3 at a rolling end temperature of the Ar₃ point or more, then
5 cooling it by a cooling rate of 20°C/sec or more until 650°C to 750°C, then air cooling it for 2 to 15 seconds, further cooling it, then coiling it at a temperature of less than 300°C.

6. A method of production of high strength hot
10 rolled steel sheet excellent in burring, elongation, and ability of phosphate coating characterized by having a tensile strength of 590 N/mm² or more, characterized by ending hot rolling of a slab comprised of a steel
composition as set forth in any one of claims 1, 2, and 4
15 at a rolling end temperature of the Ar₃ point or more, then cooling it by a cooling rate of 20°C/sec or more to 650 to 800°C, then air cooling it for 2 to 15 seconds, then further cooling it by a cooling rate of 20°C/sec or more to 350 to 600°C and coiling it.